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## PATENT SPECIFICATION

1,102,270

DRAWINGS ATTACHED.

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## COMPLETE SPECIFICATION.

## Improvements in and relating to Light Fittings.

We, FALKS LIMITED, a British Company, of 91, Farringdon Road, London, E.C.1, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to light fittings, and in particular for fittings adapted to accommodate a strip light source, for example, a strip light source of the high intensity fluorescent variety.

Existing strip light fittings comprise an elongate casing member containing control means for the light source, which casing member is provided at or towards each end thereof with upstanding terminal members adapted to make electrical contact with, and to secure and support with respect thereto, a strip light source usually in the form of a fluorescent lighting tube. Means are usually provided on said casing or said terminals for securing a diffusing screen of a plastics material about the tube supported between the terminals to diffuse the light emanating from said source when in operation. Such fixtures are usually fixed to the ceiling surface so that the strip light source is disposed substantially parallel to and spaced downwardly from said ceiling surface. While these known fittings provide adequate illumination, they result in a very high glare factor since the illuminated strip light source is clearly visible through the diffuser when viewed through a comparatively small vertical angle from the horizontal. Thus, in a large office illuminated by a large number of these fittings, it is possible for an observer to suffer considerable visual discomfort as a result of the glare, the glare being noticeable from those fittings which

can be viewed through a comparatively small vertical angle.

According to the present invention there is provided a fitting for an elongate lighting element, which fitting includes an elongate parabolic reflecting surface having a plurality of spaced louvres members of substantially wedge shaped cross section disposed transversely with respect to the elongate axis of said surface and arranged so that the surfaces of said louvres members converge in a direction away from said element.

The present invention also includes a fluorescent light fitting comprising an elongate substantially rectangular box having means for accommodating at or towards the top of said box and parallel with the elongate axis thereof a fluorescent lighting tube, a reflector comprising an elongate parabolic reflector member having a plurality of transversely disposed spaced louvres of substantially wedge shaped cross section said parabolic reflector means being cut away to accommodate said fluorescent lighting tube, means for securing said reflector to said casing, the arrangement being such that the wedge shaped louvres members converge in a direction away from said tube so that with an observer viewing said fitting and light emanating therefrom through a vertical angle with the horizontal of less than 50°, no direct view of the light source can be obtained. The lighting source is preferably located with respect to said reflecting surface so that the elongate axis of the source is substantially coincident with the line defining the focus of the elongate reflector.

Following is a description with reference to the accompanying drawings of a light

[Price 4s. 6d.]

sitting in accordance with the present invention.

In the drawings:—

Figure 1 is a perspective view of the light fitting with the reflector removed from the casing.

Figure 2 is a detail of the support bracket for the fitting of Figure 1.

Figure 3 is a cross section of the assembled fitting of Figure 1.

Figure 4 is a part longitudinal section of the assembled fitting of Figure 1.

The fitting comprises a casing 10 adapted to carry a fluorescent lighting tube 11 and a reflector 12 adapted to be inserted in said casing 10.

The casing 10 comprises a substantially elongate rectangular box having elongate side walls 13 depending from the top 14 thereof when the fitting is considered in the operative position, and end walls 15, the base of the box being open. The periphery of the side walls 13 and end walls 15 surrounding the open base of the box is turned back to provide an outwardly projecting flange 16, each of the side walls 13 being provided in the outer surface thereof towards the bottom edge with a pair of horizontally spaced outwardly projecting brackets 17 each of which carries a decorative channel element 18 spaced about the lower opening of the casing 10 defined by said flange 16. The decorative element 18 comprises a channel member, one arm 20 of which is secured in a substantially horizontal plane to said spaced brackets 17 and the lower arm 21 of which is maintained in a similar horizontal plane to the flange 16 disposed about the lower opening of the casing 10 and in spaced relationship from the periphery thereof. The intermediate portion 22 of the channel joining said arms is disposed in a substantially vertical plane and outwardly with respect to the fitting and the upper horizontal surface of the upper arm 20 of the decorative element 18 may serve to support a ceiling of interlocking tiles 23, so that the ceiling surface so formed is in the plane containing the open base of the casing 10 of the fitting.

The top 14 of the casing 10 is provided towards each end and on the elongate axis thereof with a pair of spaced, downwardly depending terminal members 25 adapted to accommodate and support a fluorescent lighting tube 11 of the type well known in the art. A typical tube is a 5 foot 65 Watt MCF/U Lamp. The arrangement of the terminal members 25 is such that the tube 11 is maintained with its axis in spaced relation to the top 14 of said casing 10. The top 14 of the casing 10 is also provided, along the elongate axis thereof and secured thereto, with an elongate parabolic element 27 constituting part of the reflector surface

and disposed between the top 14 of the casing 10 and the tube 11. The parabolic element 27 is secured to the top 14 of the casing 10 by means of rivets 28 along the central axis thereof with the edges of the parabolic portion 29 of the reflector member 27 subtending an arc of substantially 120° at the focus of the parabola, which is coincident with the elongate symmetry axis of the fluorescent tube 11. The longitudinal edges 30 of the reflector element 27 are turned back and abut or are secured to the top 14 of the casing 10.

The casing 10 is further provided on the internal surface of the side walls 13 thereof with a pair of spaced elongate magnetic support members 32, disposed with their elongate axis substantially parallel to the elongate axis of the fitting, the lower surface 33 of said support members 32 being provided with a pair of spaced elongate magnetic poles for the purpose hereinafter described.

The top 14 of the casing 10 carries towards one side and intermediate the length thereof, the control circuits 35 and wiring for the fluorescent tube 11, these being of a type well known in the lighting art.

The reflector 12 comprises an elongate curved reflector surface 36 of substantially parabolic cross section. The reflector 12 is adapted to be inserted in the casing 10 so that the concave reflecting surface 36 diverges in a downward direction away from the lighting tube 11 and terminates towards its lower end in an outwardly and upwardly turned flange 38 which is a clearance fit within the bottom opening of the casing 10.

The external convex surface 39 is provided with a pair of spaced outwardly projecting brackets 40 on each side, each bracket having a substantially horizontal portion 41 accommodating a keeper member 42 for each of said magnetic supports 33 and adapted to co-operate with said magnetic supports 33 the arrangement being such that on offering the reflector 12 up into the casing 10 the keeper members 42 on said brackets 40 comes into contact with the poles of the magnetic support members 33 thereby completing the magnetic circuit between the said magnetic poles and the keepers 42 carried on the reflector 12 to maintain the reflector 12 in position within the casing 10. The apex of the parabola defined by the reflector 12 is cut away at 50 to accommodate the fluorescent lighting tube 11, said cut away portion subtending an angle of substantially 120° at the focus of the parabola and being symmetrical about the plane containing the principal axes of said reflector 12, the arrangement being such that the reflecting surface 36 of the reflector 12 forms a substantially continuous parabolic surface with the reflector element 130

27 secured to the top 14 of the casing 10. The ends of the elongate parabolic reflector surface 36 are each defined by end members 51 riveted to the parabolic reflecting surface and inclined to the vertical at an angle of substantially  $10^\circ$  to slope downwardly and outwardly with respect to the light source 11. 5 The reflector 12 is provided between the ends 51 thereof with a plurality of spaced transversely disposed louvre members 55, said louvre members 55 being located across the reflector 12 and being of wedge shaped cross section, the arrangement being such that the reflecting surfaces 56 of each louvre 55 converge in a direction away from the light source. 10 The external reflecting surfaces 56 of the louvres 55 and the concave reflecting surface 36 of the reflector 12 is provided with a specular reflecting finish and the arrangement is such that when viewed from an end a cut-off angle of  $40^\circ$  results, and when viewed from a side a cut-off angle of substantially  $47^\circ$  is obtained. 15 The casing 10 is further provided in each end 15 thereof and adjacent the top 14 with a pair of spaced slots 58 and the side walls 13 adjacent the ends are provided with a pair of vertically spaced screw holes 59 adapted to accommodate rivets 60 securing a support bracket 61 to said side walls 13. 20 The support bracket 61 itself comprises a U-shaped channel member 62 having a pair of spaced holes 63 in the intermediate portion 64 thereof adapted to co-operate with the spaced holes 59 in said side wall 13, the arms 65 of said bracket each being provided with a drilling and carries a threaded member 66 for relative rotation with respect to said arms 65. The threaded member 66 carries an elongate member 67 of channel shaped cross section having a corresponding threaded drilling in the sides 40 68 and at one end thereof, the arrangement being such that rotation of the threaded member 66 extending between the arms 65 of the channel member 62 results in movement of the elongate channel member or arm 67 between said arms 65. 45 The bracket 61 is secured to the inner surface of the side walls 13 of the casing 10 so that the arm 67 attached to the rotatable threaded member 66 therein can be projected outwardly of the casing 10 through the slot 58 in the end 15 to rest on a supporting element 70 above the ceiling 23 in which the fitting is to be located, the arrangement being such that rotation of the screw threaded member 66 permits raising or lowering of the fitting with respect to said support 70. 50 By using the fitting described above, it is possible to obtain a high intensity light distribution from a recessed ceiling light 55 60 65

fitting having a B.Z. factor of not more than 1 thus permitting a considerable reduction of the glare having regard to the glare that would be obtained with a normal fitting. The B.Z. factor is determined by the British Zonal method as described in the I.E.S. Technical Report No. 2, under the heading The Calculation of coefficient of utilisation—The British Zonal Method, published by the I.E.S.—August 1961. 70 75

**WHAT WE CLAIM IS:—**

1. A fitting for an elongate light source, which fitting includes an elongate parabolic reflecting surface having a plurality of spaced louvres members of substantially wedge shaped cross section disposed transversely with respect to the elongate axis of said surface and arranged so that the surfaces of said louvre members converge in a direction away from said source. 80
2. A fluorescent light fitting comprising an elongate substantially rectangular box having means for accommodating at or towards the top of said box and parallel with the elongate axis thereof a fluorescent lighting tube, a reflector comprising an elongate parabolic reflector member having a plurality of transversely disposed spaced louvres of substantially wedge shaped cross section, said parabolic reflector means being cut away to accommodate said fluorescent lighting tube, means for securing said reflector to said casing, the arrangement being such that the wedge shaped louvre members converge in a direction away from said tube 100 so that on viewing said fitting and light emanating therefrom from a vertical angle with the horizontal of less than  $50^\circ$  no direct view of the light source can be obtained. 95
3. A fitting as claimed in either of the preceding claims wherein the lighting source is located with respect to said reflecting surface, so that the elongate axis of the source is substantially coincident with the line defining the focus of the elongate parabolic reflector. 105
4. A fitting as claimed in claim 2 or claim 3 wherein the casing comprises a substantially elongate rectangular box having elongate side walls depending from the top 115 thereof, the base of the box being open.
5. A fitting as claimed in claim 4 wherein in the edge of the side and end walls surrounding the open base of the box is turned back to provide an outwardly projecting flange, each of the side walls being provided on the outer surface thereof, and towards the flange with a pair of horizontally spaced outwardly projecting brackets, each of which carries a decorative channel element 120 125 spaced about the lower opening of the casing defined by said flange.
6. A fitting as claimed in claim 5 wherein the decorative element comprises a

channel member one arm of which is secured in a substantially horizontal plane to said spaced brackets and the lower arm of which is maintained by said bracket in a similar horizontal plane to the flange disposed about the lower opening of the casing and in spaced relationship from the periphery thereof, the intermediate portion of the channel joining said arms being disposed in a substantially vertical plane and outwardly with respect to the fitting, the arrangement being such that said decorative element is capable of supporting a ceiling of interlocking tiles.

7. A fitting as claimed in any one of claims 4 to 6 wherein the top of the casing is provided towards each end and on the longitudinal axis thereof with a pair of spaced downwardly depending terminal members adapted to accommodate and support a lighting tube the arrangement being such that the tube is maintained with its axis in spaced relation to the top of said casing.

8. A fitting as claimed in any one of claims 4 to 7 wherein the top of the casing is provided along the elongate axis thereof and secured thereto an elongate parabolic element constituting part of the reflector and disposed between the top of the casing and the lighting element.

9. A fitting as claimed in claim 8 wherein said parabolic element is secured to the top of the casing along the central axis thereof with the edges of the parabolic portion of the reflector member subtending an arc of substantially  $120^\circ$  at the focus of the parabola.

10. A fitting as claimed in any one of the preceding claims wherein the casing is provided on an internal surface of each of the side walls with a pair of spaced magnetic members the lower surface of which members is provided with a pair of spaced magnetic poles.

11. A fitting as claimed in any one of the preceding claims wherein the reflector portion comprises an elongate curved reflector surface of substantially parabolic cross section, said reflector portion being adapted to be inserted in the casing so that the concave reflecting surface diverges in a downward direction away from the lighting element and terminates towards its lower end in an outwardly and upwardly turned flange which is a clearance fit within the opening of the casing.

12. A fitting as claimed in claim 11 wherein the apex of the parabolic reflector portion is cut away to accommodate the elongate lighting element, said cut away portion subtending an angle of substantially  $120^\circ$  at the focus of the parabola and being symmetrical about the plane containing the principal axis of said reflector, the arrangement being such that the reflecting surface of the reflector forms a substantially continuous parabolic surface with the reflector element secured to the top of the casing.

13. A fitting as claimed in any one of the preceding claims wherein the external convex surface of the reflector portion is provided with a pair of spaced outwardly projecting brackets on each side, each bracket having a substantially horizontal portion accommodating a keeper member for each of said magnetic supports adapted to cooperate with said magnetic supports the arrangement being such that on offering the reflector up into the casing, the keeper members on said brackets come into contact with the poles of the magnetic support members thereby completing the magnetic circuit between said magnetic poles and the keepers carried on the reflector to maintain the reflector in position within the casing.

14. A fitting as claimed in any one of the preceding claims wherein the ends of the elongate parabolic reflector surface are each defined by end members riveted to the parabolic reflecting surface and inclined to the vertical at an angle of substantially  $10^\circ$  to slope downwardly and outwardly with respect to the light source.

15. A fitting as claimed in claim 14 wherein the reflector is provided with a plurality of spaced transversely disposed louvre members, said louvre members being located across the parabolic reflector portion and being of wedge shaped cross section, the arrangement being such that the reflecting surfaces of each louvre converge in a direction away from the light source, the arrangement being such that when viewed from an end a cut off angle of  $40^\circ$  results and when reviewed from a side a cut off angle of substantially  $47^\circ$  is obtained.

16. A fitting as claimed in any one of the preceding claims wherein the external surfaces of the louvre members and the concave surface of the reflector are provided with a specular reflecting surface.

17. A fitting as claimed in any one of the preceding claims wherein the casing is further provided in each end thereof and adjacent the top with a pair of spaced slots and the side walls adjacent the ends accommodate a support bracket.

18. A fitting as claimed in claim 17 wherein the support bracket comprises a U-shaped channel member having a pair of spaced holes in the intermediate portion thereof, adapted to co-operate with spaced holes in said side wall, the arms of said brackets each being provided with a drilling and carrying a threaded member for relative rotation with respect to said arms, the threaded member carrying an elongate member of channel shaped cross section having

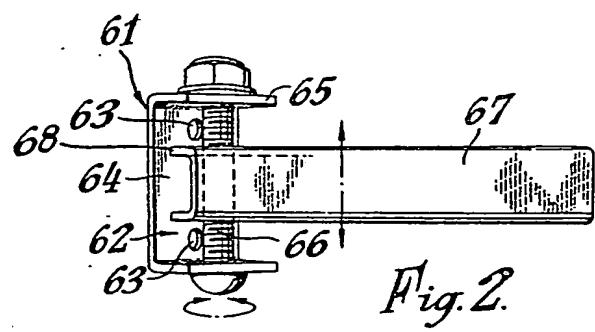
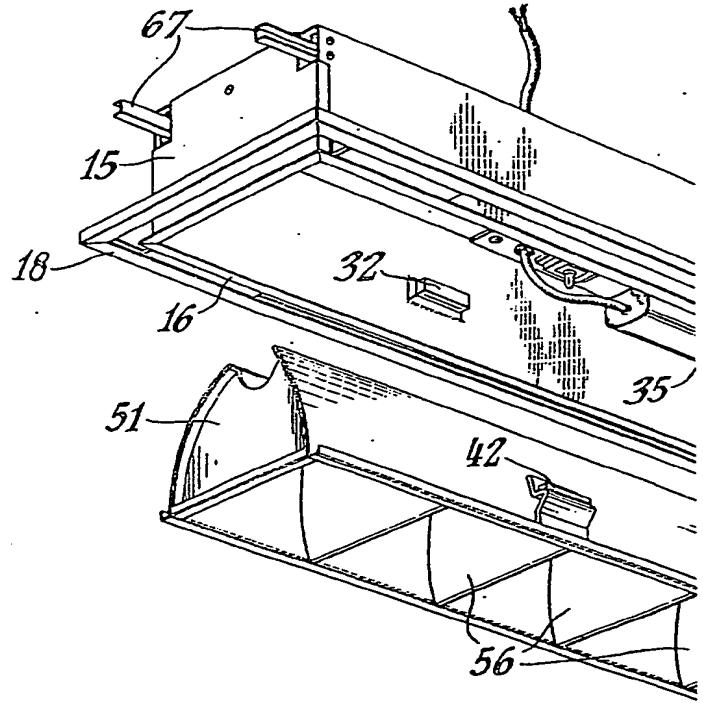
a corresponding threaded drilling in the side arms and at one end thereof, the arrangement being such that rotation of the threaded member extending between the 5 arms of the channel bracket results in movement of the elongate channel member between the arms, thereby permitting adjustment of the height of the fitting with respect to a support therefor.

10 19. A light fitting substantially as here-

in described with reference to and as illustrated in Figures 1 to 4 of the accompanying drawings.

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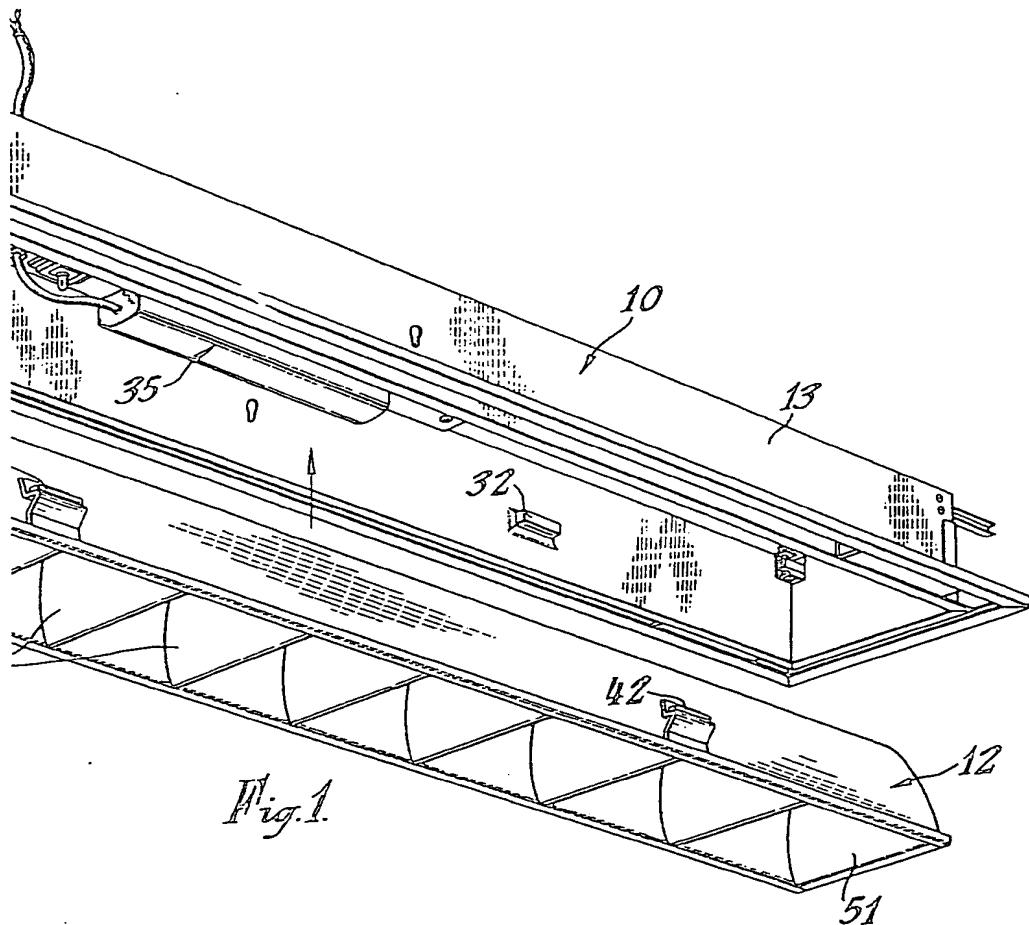
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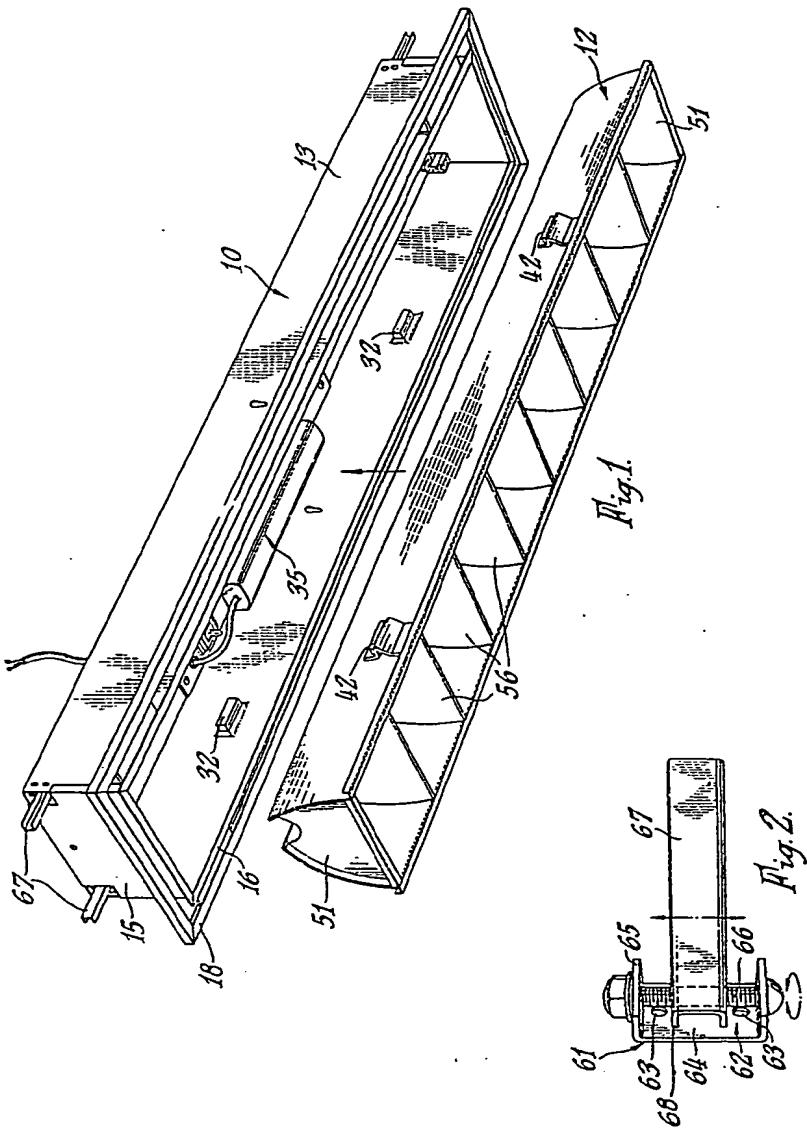
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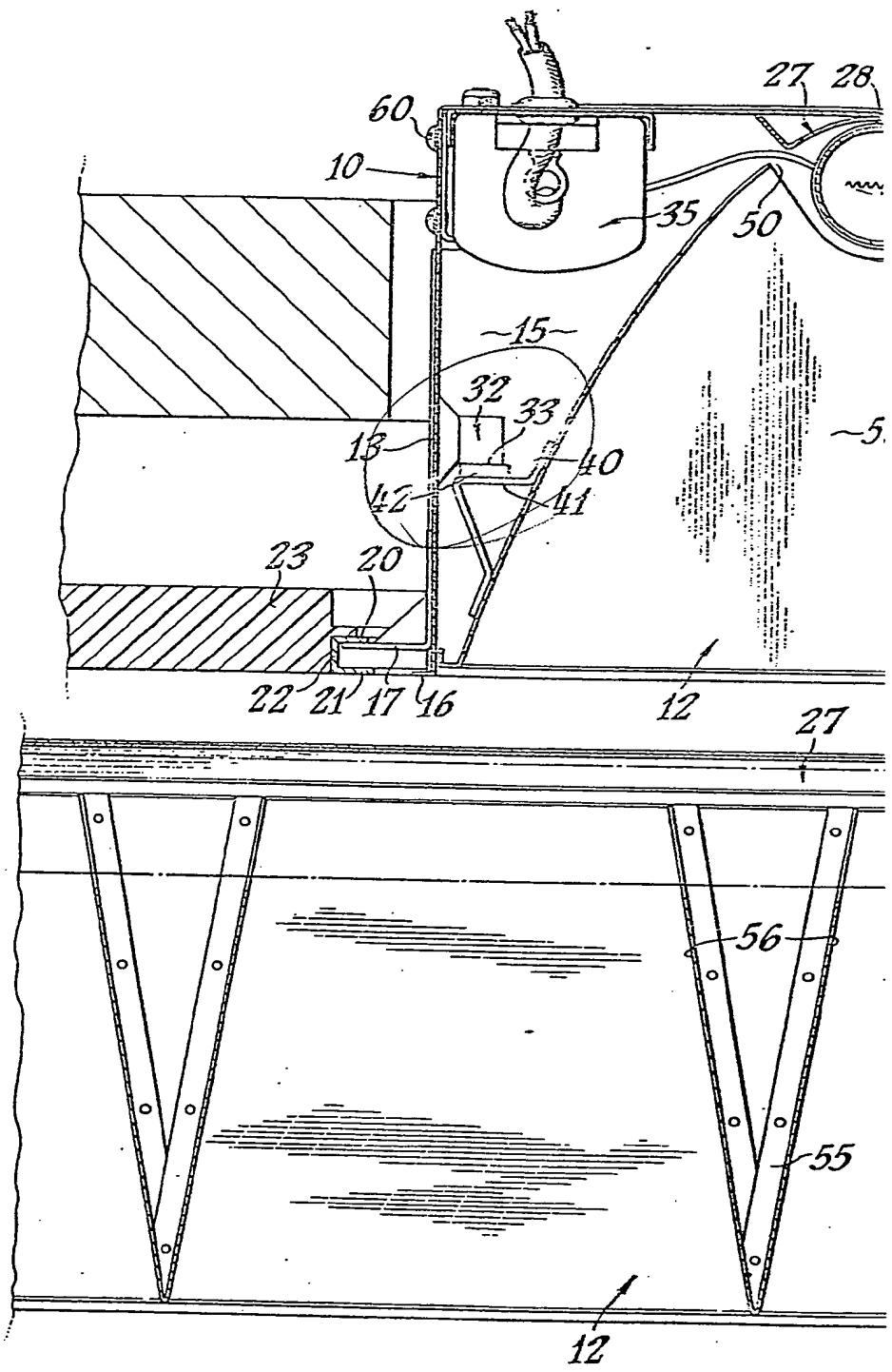
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Sheet 1



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## **COMPLETE SPECIFICATION**

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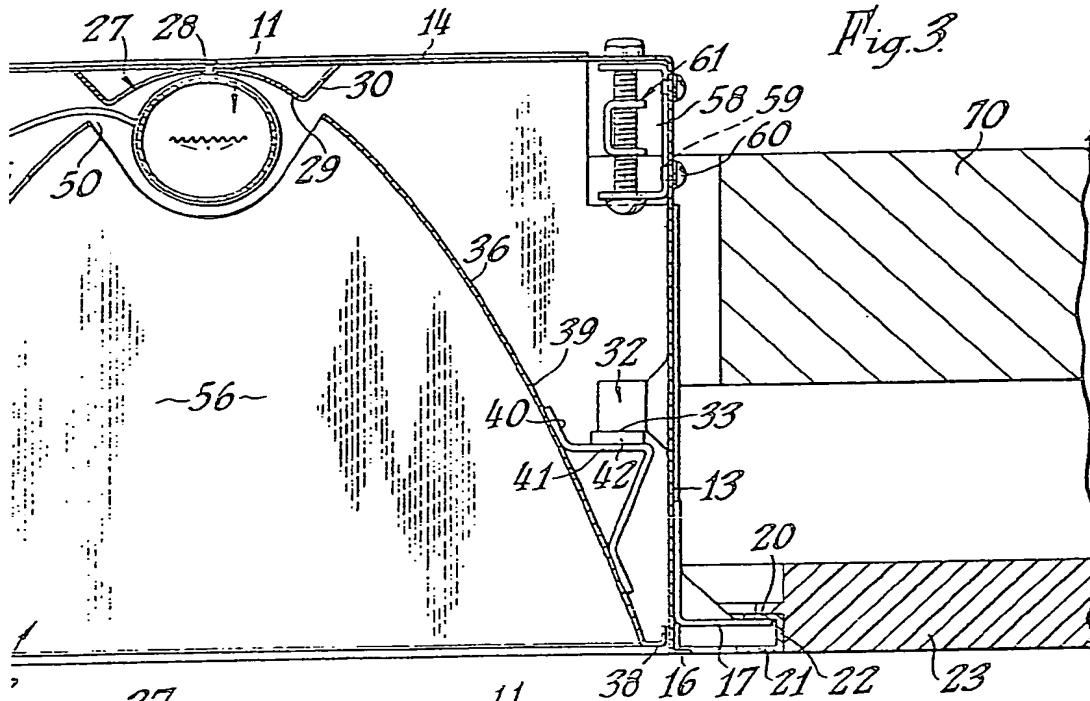


Fig. 3.

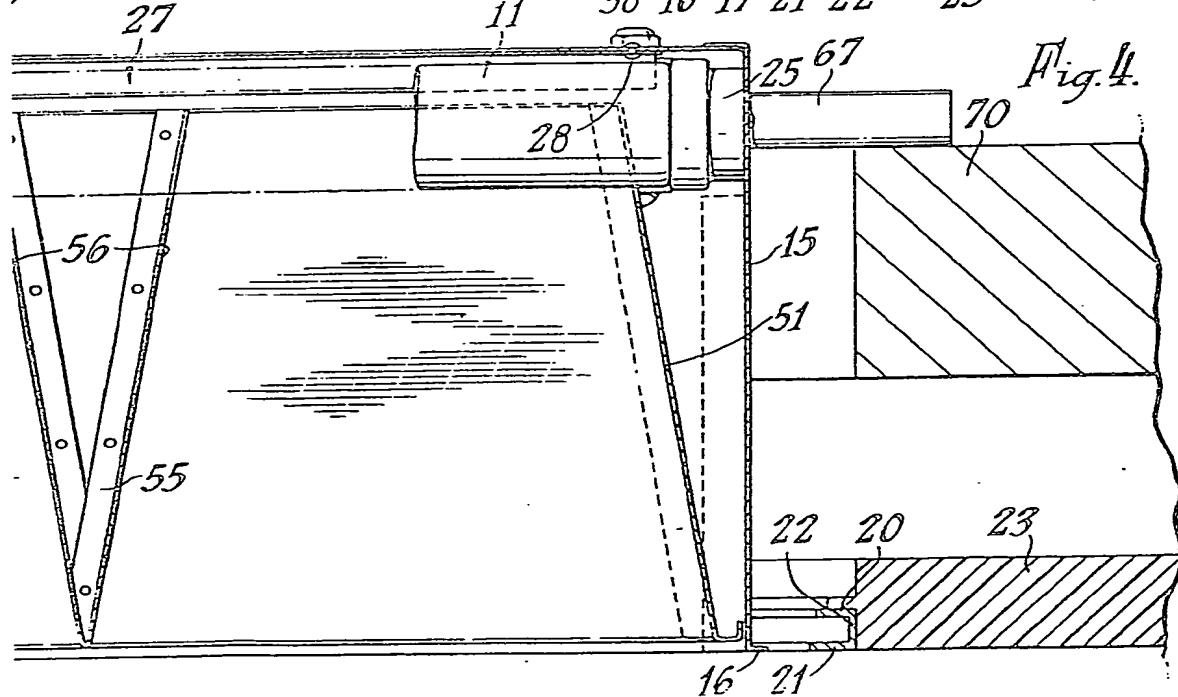


Fig. 4.

Fig.3

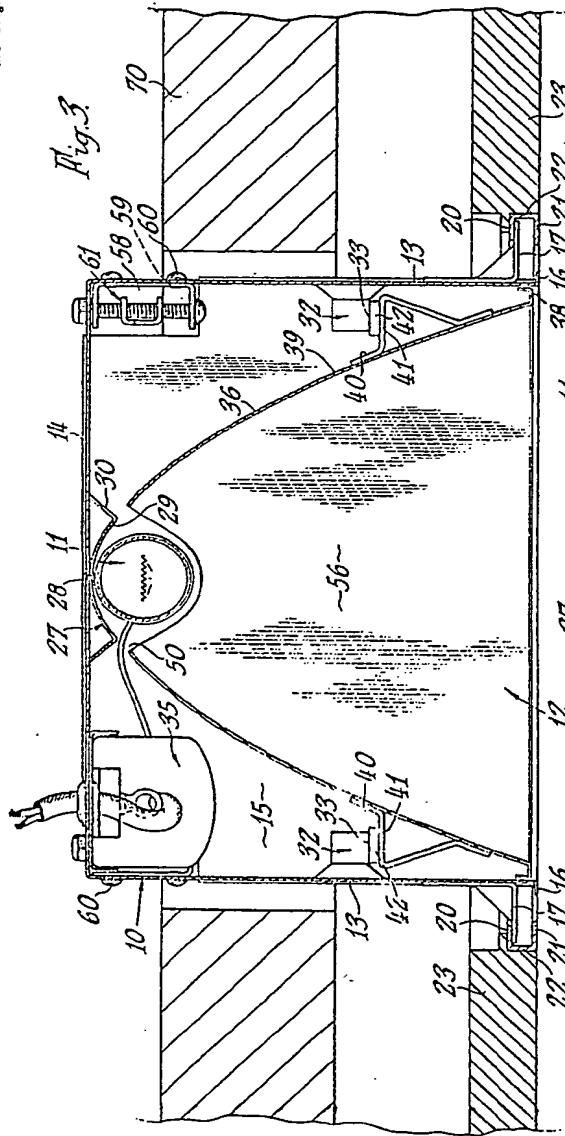
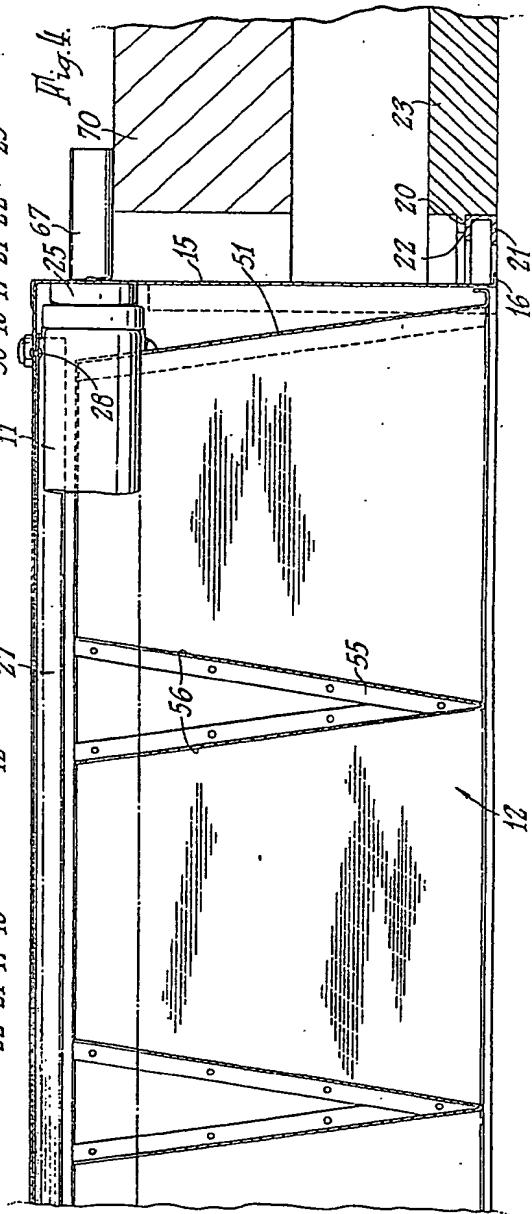


Fig.4



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